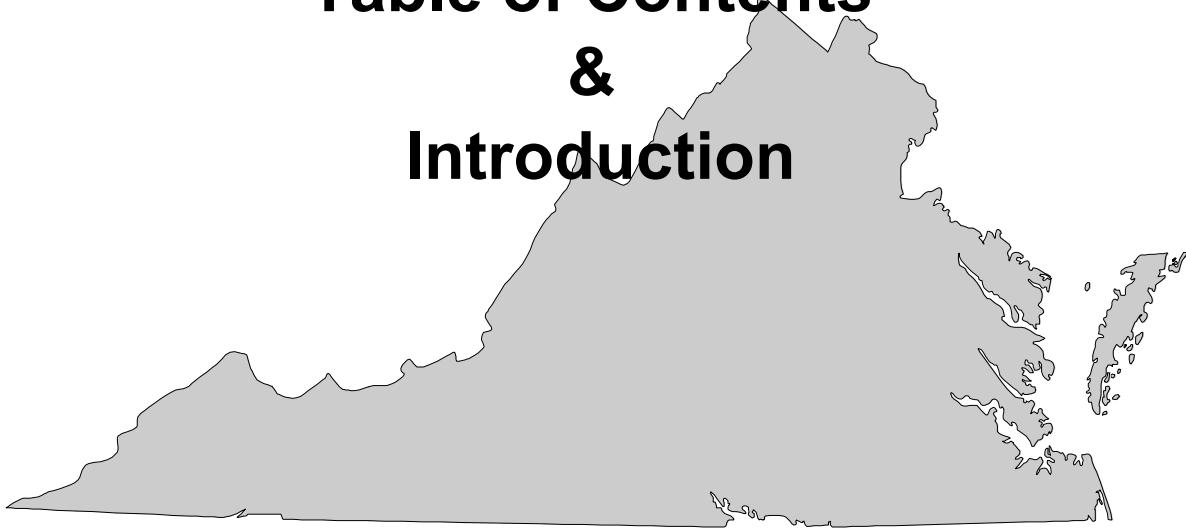


THE BIENNIAL NONPOINT SOURCE POLLUTION WATER QUALITY ASSESSMENT REPORT

September 2002

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INTRODUCTION AND EXECUTIVE SUMMARY

This 2002 Nonpoint Source Pollution Water Quality Assessment Report was prepared by the Virginia Department of Conservation and Recreation (DCR). It fulfills the legislative requirement under Section 10.1-2127 of the Virginia Water Quality Improvement Act (WQIA) of 1997, Chapter 21.1 of Title 10.1 of the *Code of Virginia*. As required by the act, and consistent with Section 319 of the federal Clean Water Act, reported herein is an evaluation of the impacts of nonpoint source (NPS) pollution on water quality in the Commonwealth of Virginia.

This assessment report expands on and complements nonpoint source water quality information presented in the Clean Water Act Section 305(b) Report. The 305(b) Report is the commonwealth's primary water quality report. Information contained in the NPS chapter of the 2002 305(b) report is repeated in this document. Included in this information is a watershed level assessment of impaired waters as reported in the 2002 Section 303(d) Report. The 303(d) Report contains a listing of all monitored waters in the state which are found to be impaired as of the date of its publication.

As with previous assessment reports, the 2002 Nonpoint Source Pollution Water Quality Assessment Report provides a nonpoint source pollution assessment at the smallest statewide watershed scale. For the first time, however, this assessment report was developed using a water quality model. This model, known as the Generalized Watershed Loadings Function model, utilized numerous datasets often developed specifically for this application. In addition, the model was adjusted in order to produce results that are consistent with the well established Chesapeake Bay Watershed Model. This approach has yielded a more precise process for assessing nonpoint source pollution at the watershed scale than has been used in the past. Another advantage of this approach is that, for the first time, it provides a basis for estimating total loads of pollutants such as nutrients and sediments.

Other significant additions to the 2002 Nonpoint Source Pollution Water Quality Assessment Report are the inclusion of water supply and living resources information. For the first time, drinking water supply information is included in this document. This information provides decision makers with a basis for targeting nonpoint source pollution control efforts based on known public surface water supplies. Also for the first time, the 2002 Nonpoint Source Pollution Water Quality Assessment Report includes a watershed level analysis of biological integrity. Although previous assessment reports have included some living resources information, this information has been limited to water dependent rare, threatened, and endangered species data. Utilizing over 150,000 fish, mollusk, and crayfish records, watersheds were ranked using a multi-metric index of biological integrity. The inclusion of this type of analysis provides a valuable tool in making watershed prioritization decisions. While this assessment report does not attempt to produce a combined watershed prioritization based on nonpoint source loadings estimates along with watershed level analyses of water quality impairments, source water supplies, and water dependant living resources, it does provide policy and decision makers with a flexible and powerful capability for making resource allocation and prioritization decisions.

This report begins with a description of hydrologic unit geography and the NPS pollution

assessment process and results. The second section of the report contains river basin summary information. Each basin, its subbasins, and cataloging units, are described by physical characteristics. Assessment information is reported by detailed hydrologic units delineated within Virginia. Water quality improvement actions for fiscal years 2000 and 2001 (FY00 and FY01) are summarized by basin. Water quality improvements, i.e., the reduction of nitrogen, phosphorus, and sediment (soil loss), were accomplished by installation of best management practices (BMPs) through the Virginia Agricultural Cost-share Program, and the implementation of Water Quality Improvement Act projects. These totals do not include pollutant reductions attributed to the federal cost-share program nor voluntary practices. ‘State funds’ refers to the actual amount provided to landowners and producers, enabling achievement of these reductions.

Hydrologic Unit Geography

The river basins of the commonwealth as used in this document are as follows: Potomac River, Rappahannock River, York River, James River, Small Coastal Rivers and Eastern Shore, Chowan River, Albemarle Sound Coastal, Roanoke River, Yadkin River (commonly known as Ararat/Fisher), New River, Upper Tennessee River, and Big Sandy River. No part of Virginia, except for offshore ocean claims, is unaccounted for in these basins. [Figure 1](#) displays the basin and major subbasin boundaries in Virginia, as used in this report.

A description of basins in regard to the partitioning of the drainage in Virginia is somewhat arbitrary. Federal designations do exist, however, for other defined hydrologic units: regions, subregions, accounting units, and cataloging units (first, second, third, and fourth order hydrologic units, respectively). Regions are designated by a two-digit code (i.e. 02), subregions by a four-digit code (i.e. 0208), accounting units by 6-digit codes (i.e. 020801), and cataloging units by 8-digit codes (i.e. 02080105). The more digits required to identify a hydrologic unit, the smaller that unit is. For example, all of Virginia is covered by parts of only 5 regions, but the same area includes all or part of 48 cataloging units. Table 1 lists the regions, subregions, accounting units, and cataloging units found in Virginia. Cataloging unit descriptions are found within the basin chapters.

Cataloging units average about 700 square miles in size, which is too large an area to evaluate as a single entity in regard to water quality conditions. Evaluating such an expanse would result in generalizations that could completely mask problem areas. The commonwealth has delineated, therefore, a more detailed sixth order of watersheds for this purpose.

A watershed is defined as a land area drained by a river or stream, or system of connecting rivers and streams, such that all water within the area flows through a single outlet. It is believed that for NPS pollution water quality assessment, where all pollutant movement is governed by naturally occurring systems, watersheds are the appropriate evaluating units. The DCR Division of Soil and Water Conservation (DCR-DSWC) and the United States Department of Agriculture-Natural Resources Conservation Service (USDA-NRCS) delineated detailed sixth order hydrologic units for Virginia in 1995. This delineation resulted in the creation of 494 individual watershed units that are subsets of the 48 nationally recognized cataloging units occurring in the state. Virginia has developed a 3-character code (i.e. A32) as shorthand for the watershed designations. Only these 3-character codes are used in this document when referring to sixth order watersheds (see [Figure 1](#)). More information about the sixth order watersheds can be found in the *Virginia Hydrologic Unit Atlas* (DCR, USDA-NRCS, 1995).

Table 1. Regions, Subregions, Accounting Units, and Cataloging Units in Virginia

<u>Region</u>	<u>Subregion</u>	<u>Accounting Unit</u>	<u>Cataloging Units</u>
02 - Mid-Atlantic			
	0206 - Upper Chesapeake	020600 - Upper Chesapeake	02060009 - Pocomoke 02060010 - Chincoteague
	0207 - Potomac	020700 - Potomac	02070001 - South Branch 02070004 - Conococheague-Opequon 02070005 - South Fork Shenandoah 02070006 - North Fork Shenandoah 02070007 - Shenandoah 02070008 - Middle Potomac-Catoctin 02070010 - Middle Potomac-Anacostia-Occoquan 02070011 - Lower Potomac
	0208 - Lower Chesapeake	020801 - Lower Chesapeake	02080101 - Lower Chesapeake 02080102 - Great Wicomico-Piankatank 02080103 - Rapidan-Upper Rappahannock 02080104 - Lower Rappahannock 02080105 - Mattaponi 02080106 - Pamunkey 02080107 - York 02080108 - Lynnhaven-Poquoson 02080109 - Western Lower Delmarva 02080110 - Eastern Lower Delmarva
		020802 - James	02080201 - Upper James 02080202 - Maury 02080203 - Middle James-Buffalo 02080204 - Rivanna 02080205 - Middle James-Willis 02080206 - Lower James 02080207 - Appomattox 02080208 - Hampton Roads
03 - South Atlantic-Gulf			
	0301 - Chowan-Roanoke	030101 - Roanoke	03010101 - Upper Roanoke 03010102 - Middle Roanoke 03010103 - Upper Dan 03010104 - Lower Dan 03010105 - Banister 03010106 - Roanoke Rapid

<u>Region</u>	<u>Subregion</u>	<u>Accounting Unit</u>	<u>Cataloging Units</u>
		030102 - Albemarle-Chowan	
		03010201 - Nottoway	
		03010202 - Blackwater	
		03010203 - Chowan	
		03010204 - Meherrin	
		03010205 - Albemarle	
	0304 - Pee Dee		
		030401 - Upper Pee Dee	
		03040101 - Upper Yadkin	
05 - Ohio			
	0505 - Kanawha		
		050500 - Kanawha	
		05050001 - Upper New	
		05050002 - Middle New	
	0507 - Big Sandy		
		050702 - Big Sandy	
		05070201 - Tug	
		05070202 - Upper Levisa	
06 - Tennessee			
	0601 - Upper Tennessee		
		060101 - French Broad-Holston	
		06010101 - North Fork Holston	
		06010102 - South Fork Holston	
	060102 - Upper Tennessee		
		06010205 - Upper Clinch	
		06010206 - Powell	